

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1, 12, 21 and 24 are amended. No claims are added or canceled. Claims 1-26 are pending in this application.

Examiner Interview

A telephonic interview with Examiner Cindy Nguyen and Examiner Wayne Amsbury was held on March 23, 2004. Several issues were discussed and, among these, the following points were identified to be clarified.

1) The first sentence of the Summary reads "The implementations described herein concern a 'partial pre-aggregation' operation that is similar to an aggregation, but that *does not necessarily* continue the aggregation process until there is only one output record for each group." (Emphasis added).

Given that Applicant seeks to distinguish the primary reference by amending the claims to clarify that a partial pre-aggregation is performed on a single grouping column, Applicant agreed to disclaim the exact language of the first sentence of the specification (i.e. "does not necessarily continue"). As pointed out in the Specification and Claims, a partial pre-aggregation is an aggregation on a single grouping column that does not continue the aggregation process until there is only one output record for each unique grouping column value. In other words, after a partial pre-aggregation on a grouping column, there may be two or more records that have an identical grouping column value.

2) In Applicant's previous response to the Office Action dated June 18, 2003, Applicant argued that the operation in the Dalal reference relied on by the Examiner as being a partial pre-aggregation was a database operation known in the art as a "group by with rollup." In some database implementations (such as SQL),

1 the group by with rollup operation is referred to as "grouping sets." The language
2 in the reference that refers to this operation as "an aggregation" is erroneous.

3 3) Although the Dalal reference refers to the multiple-level aggregation as
4 a single aggregation, Applicant contends that it is instead a series of unique
5 aggregation operations. However, by specifying in the amendments herein that a
6 partial pre-aggregation is performed on a single grouping column, the claims are
7 allowable over Dalal in any event.

8
9 35 U.S.C. § 102

10 Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24

11 Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24 are rejected under 35 U.S.C.
12 §102(b) as being anticipated by U.S. Patent Number 5,781,896 issued to Dalal
13 (hereinafter "Dalal"). Applicant respectfully traverses the rejection.

14 Anticipation is a legal term of art. Applicant notes that in order to provide a
15 valid finding of anticipation, several conditions must be met: (i) the reference must
16 include every element of the claim within the four corners of the reference (see
17 MPEP §2121); (ii) the elements must be set forth as they are recited in the claim
18 (see MPEP §2131); (iii) the teachings of the reference cannot be modified (see
19 MPEP §706.02, stating that "No question of obviousness is present" in conjunction
20 with anticipation); and (iv) the reference must enable the invention as recited in the
21 claim (see MPEP §2121.01). Additionally, (v) these conditions must be
22 simultaneously satisfied.

23 The §102 rejection of claims 1, 8, 9, 11, 12, 17, 19, 21 and 24 is believed
24 to be in error. Specifically, the PTO and Federal Circuit provide that §102
25 anticipation requires that each and every element of the claimed invention be

1 disclosed in a single prior art reference. *In re Spada*, 911 F.2d 705,
2 15 USPQ2d 1655 (Fed. Cir. 1990). The corollary of this rule is that the
3 absence from a cited §102 reference of any claimed element negates the
4 anticipation. *Kloster Speedsteel AB, et al. v. Crucible, Inc., et al.*,
5 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986).

6 No §103 rejection has been lodged regarding claims 1, 8, 9, 11, 12, 17,
7 19, 21 and 24. Accordingly, if Applicant can demonstrate that Dalal does not
8 disclose any one claimed element with respect to claims 1, 8, 9, 11, 12, 17, 19,
9 21 and 24, the §102 rejections must be withdrawn, and a subsequent non-final
10 action made with a different rejection in the event that the Examiner still finds
11 any of such claims to be unallowable.

12 Applicant notes the requirements of MPEP §2131, which states that
13 "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY
14 ELEMENT OF THE CLAIM." This MPEP section further states that "A
15 claim is anticipated only if each and every element as set forth in the claim is
16 found, either expressly or inherently described, in a single prior art reference.'
17 *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2
18 USPQ2d 1051, 1053 (Fed. Cir. 1987). 'The identical invention must be
19 shown in as complete detail as is contained in the ... claim.' *Richardson v.*
20 *Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir.
21 1989). The elements must be arranged as required by the claim, but this is not
22 an ipsissimis verbis test, i.e., identity of terminology is not required. *In re*
23 *Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."

24 Claim 1 has been amended to clarify that the partial aggregation is
25 performed with respect to a single grouping column. Claim 1 now recites "a

1 method for processing a database query,” comprising: “partially pre-aggregating
2 records in a database *according to a single grouping column*” (amendment
3 emphasized) “to provide a result that contains at least two records having like
4 grouping column values.” Claim 1 also recites the step of “aggregating records
5 derived from the partial pre-aggregation to provide a result that contains records
6 having unique grouping column values.”

7 The gist of claim 1 is that a partial aggregation - i.e., an incomplete
8 aggregation - may be performed as a preliminary step in a database query.
9 Normally after an aggregation is completed, no two records contain a grouping
10 column value that is the same as the grouping column value of another record.

11 However, as outlined in the specification, there is sometimes a benefit
12 derived from aggregating groups of records before aggregating all of the records
13 together. The final aggregation step eliminates multiple records having identical
14 grouping column values so, since the partial aggregation is merely an intermediate
15 step, an acceptable result is ultimately obtained.

16 The Office Action states that the Dalal reference anticipates claim 1.
17 Applicant disagrees. The reference does not support this statement. In the
18 discussion of Fig. 10, the reference indicates that there are two grouping columns
19 in the example shown. To-wit, “[t]he result table 1000 contains a Division
20 grouping column, a Salesperson grouping column 1002. . . ” and other columns.

21 The process described in Dalal is not a partial aggregation, but is more
22 appropriately described as a “*multiple level aggregation query*.” Dalal, column 9,
23 lines 52-53. A multiple aggregation query is a query that utilized more than one
24 grouping column, aggregating one grouping column at a time, sequentially. In the
25 example described in Dalal, the Division grouping column is aggregated, then the

1 result of that aggregation is aggregated according to the Salesperson grouping
2 column. This does not disclose or anticipate a partial aggregation (or partial pre-
3 aggregation).

4 The point of novelty described in Dalal is to perform a database query using
5 references to database items rather than the database items themselves, so as to
6 save a number of disk read and/or write operations. The reference does not
7 describe partial aggregation.

8 Accordingly, claim 1 is not anticipated by Dalal and is allowable over the
9 cited reference. The rejection, therefore, should be withdrawn.

10 Claims 8, 9 and 11 depend from claim 1 and are allowable by virtue of that
11 dependency.

12 Claim 12 has been amended to recite a relational database system that
13 includes, *inter alia*, a record store and a query processor configured "to process a
14 query on the record store according to a single grouping column, the query
15 processor being configured to partially pre-aggregate the record store to provide a
16 result that contains at least two data records that have like grouping column
17 values."

18 As previously discussed in the response to the rejection of claim 1, a typical
19 aggregation does not result in any two records having an identical grouping
20 column value. According to the specification, a partial aggregation or pre-
21 aggregation does not necessarily produce such a result. The operations referred to
22 in Dalal are sequential aggregations - one follows the other. Dalal does not
23 disclose or anticipate a partial aggregation or partial pre-aggregation.

24 Accordingly, claim 12 is allowable over the cited reference and the
25 rejection thereof should be withdrawn.

1 **Claims 17 and 19** depend from claim 12 and are allowably at least by the
2 same reasoning discussed in the response to the rejection of claim 12. Therefore,
3 the rejection of claims 17 and 19 should also be withdrawn.

4 **Claim 21** has been amended and now recites a relational database computer
5 program that comprises "partial pre-aggregation code to partially pre-aggregate
6 data records according to grouping column values in a single grouping column to
7 provide a partial pre-aggregation result having two or more records having like
8 grouping column values." The relational database computer program also includes
9 "aggregation code" that aggregates the result of the partial pre-aggregation.

10 As previously discussed, Dalal does not disclose or anticipate a partial pre-
11 aggregation operation. Dalal merely discloses a multiple level aggregation.

12 Accordingly, claim 21 is allowable over the cited references and the
13 rejection of claim 21 should be withdrawn.

14 **Claim 24** recites a relational database computer program comprising
15 computer-executable instructions that perform several steps. The steps include
16 "aggregating the input records in the stream *according to a single grouping*
17 *column*" (amendment emphasized) to create a record store, "joining records in the
18 record store with other data," outputting the records from the join and aggregating
19 the records output from the join. Claim 24 also makes clear that "the records
20 output from the join include at least two records that have an identical grouping
21 column value in the single grouping column." This restriction, in essence, renders
22 the first aggregating step a partial aggregation.

23 As previously discussed, the cited reference only describes an aggregation
24 or a multiple level aggregation, wherein no records output from an aggregation
25 contain an identical value in the grouping column. The identical values cited in

1 the Office Action are contained in a grouping column on which the aggregation
2 was not performed. The operations disclosed in Dalal are merely typical
3 aggregations that completely aggregate records on a grouping column so that no
4 record resulting from the aggregation contains an identical value in the aggregated
5 grouping column. This is contrary to claim 24.

6 Claim 24 clearly recited a partial aggregation that is not disclosed in any
7 reference. As a result, claim 24 is allowable over Dalal and the rejection thereof
8 should be withdrawn.

9
10 35 U.S.C. § 103(a)

11 Claims 2-5, 13-15, 20, 22, 23 and 25

12 Claims 2-5, 13-15, 20, 22, 23 and 25 stand rejected under 35 U.S.C. 103(a)
13 as being unpatentable over Dalal in view of U.S. Patent Number 6,115,705 issued
14 to Larson (hereinafter "Larson"). Applicant respectfully traverses the rejection.

15 Larson was filed on May 19, 1997 and issued on September 5, 2000. The
16 instant application was filed on June 30, 2000. As such, Larson qualifies as prior
17 art only under the timing provisions of 35 U.S.C. §102(e).

18 Larson is assigned to the Microsoft Corporation, Redmond, WA. The
19 instant application is also assigned to the Microsoft Corporation of Redmond, WA.

20 As such, Larson is not available as prior art under 35 U.S.C. 103, as is
21 discussed in more detail in MPEP §706.02(l)(1), entitled "Rejections Under 35
22 U.S.C. 102(e)/103; 35 U.S.C. 103(c)". This MPEP section cites 35 U.S.C. 103(c):

23 35 U.S.C. 103. Conditions for patentability; non-obvious
24 subject matter.

25 (c) Subject matter developed by another person, which
qualifies as prior art only under one or more of subsections (e), (f),
and (g) of section 102 of this title, shall not preclude patentability
under this section where the subject matter and the claimed invention

1 were, at the time the invention was made, owned by the same person
2 or subject to an obligation of assignment to the same person.

3 More specifically, this MPEP section states that "Effective November 29,
4 1999, subject matter which was prior art under former 35 U.S.C. 103 via 35 U.S.C.
5 102(e) is now disqualified as prior art against the claimed invention if that subject
6 matter and the claimed invention "were, at the time the invention was made,
7 owned by the same person or subject to an obligation of assignment to the same
8 person." This change to 35 U.S.C. 103(c) applies to all utility, design and plant
9 patent applications filed on or after November 29, 1999, including continuing
10 applications filed under 37 CFR 1.53(b), continued prosecution application filed
11 under 37 CFR 1.53(d), and reissues."

12 Accordingly, Larson is not available as prior art under 35 U.S.C. §103 with
13 respect to this application, and, as such, the rejection of claims 2-5, 13-15, 20 and
14 23-25 is prima facie defective. Additionally, no other grounds for rejection have
15 been lodged regarding claims 2-5, 13-15, 20 and 23-25. Accordingly, in the event
16 that the Examiner still finds such claims to be not allowable, a subsequent non-
17 Final action must be made with different grounds for rejection.

18 The preceding notwithstanding, Applicant also presents the following
19 arguments with respect to the claims rejected under § 103(a).

20 **Claims 2-5** depend from claim 1 and are allowable at least by virtue of that
21 dependency for the reasons stated in the response to the rejection of claim 1.
22 Neither reference teaches or suggests a partial aggregation or partial pre-
23 aggregation. As discussed above, this makes the claims allowable over the cited
24 references and the rejection of these claims should be withdrawn.

25 **Claims 13-15 and 20** depend from claim 12 and are allowable at least by
virtue of that dependency for the reasons stated in the response to the rejection of

1 claim 12. The addition of Larson does not remedy the noted deficiency previously
2 discussed because Larson does not teach or suggest partial aggregation or partial
3 pre-aggregation.

4 Accordingly, the rejection of claims 13-15 and claim 20 should be
5 withdrawn.

6 Claims 22 and 23 depend from claim 21 and are allowable at least by
7 virtue of that dependency for the same reasons set forth in the response to the
8 rejection of claim 21, above. Accordingly, the rejection of these claims should be
9 withdrawn.

10 Claim 25 depends from claim 24 and is allowable at least by virtue of that
11 dependency for the same reasons set forth in the response to the rejection of claim
12 24, above. Accordingly, the rejection of claim 25 should be withdrawn.

13 Claims 6, 7, 10, 16, 18 and 26

14 Claims 6, 7, 10, 16, 18 and 26 are rejected under 35 U.S.C. 103(a) as being
15 unpatentable over Dalal in view of Larson and further in view of U.S. Patent
16 Number 6,032,144 to Srivastava et al. (hereinafter Srivastava). Applicant
17 respectfully traverses the rejection.

18 These claims depend from claims that have been shown, above, to be
19 allowable over Dalal. The addition of Larson and/or Srivastava to the analysis
20 does not provide a reference that teaches or suggests partial aggregation or partial
21 pre-aggregation.

22 As previously discussed, Larson is not available as prior art and, therefore,
23 this rejection – to the extent that it relates to the Larson reference – is defective.

24 Srivastava describes a relational database system and a method for query
25 processing using early aggregation. A collection of equivalence rules involving a

1 multi-set version of a relational algebraic theta-semijoin operation is used to
2 generate relational algebraic expressions equivalent to a computer programming
3 language query. The expressions are used by way of example to describe a process
4 that computes cost estimates for generated expressions. Based on the computed
5 cost estimates, the least costly implementation of a complex query is determined
6 and queries are cost-based optimized.

7 But Srivastava does not resolve the deficiency present in Dalal, to-wit: there
8 is no teaching or suggestion of a partial pre-aggregation operation that is required
9 by the rejected claims as a result of their dependencies.

10 Accordingly, these claims are allowable over the cited references and the
11 rejection thereof should be withdrawn.

12 **Conclusion**

13 All pending claims 1-26 are in condition for allowance. Applicant
14 respectfully requests reconsideration and prompt issuance of the subject
15 application. If any issues remain that prevent issuance of this application, the
16 Examiner is urged to contact the undersigned attorney before issuing a subsequent
17 Action.

18
19 Respectfully Submitted,

20
21 Date: 4-16-04

22
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